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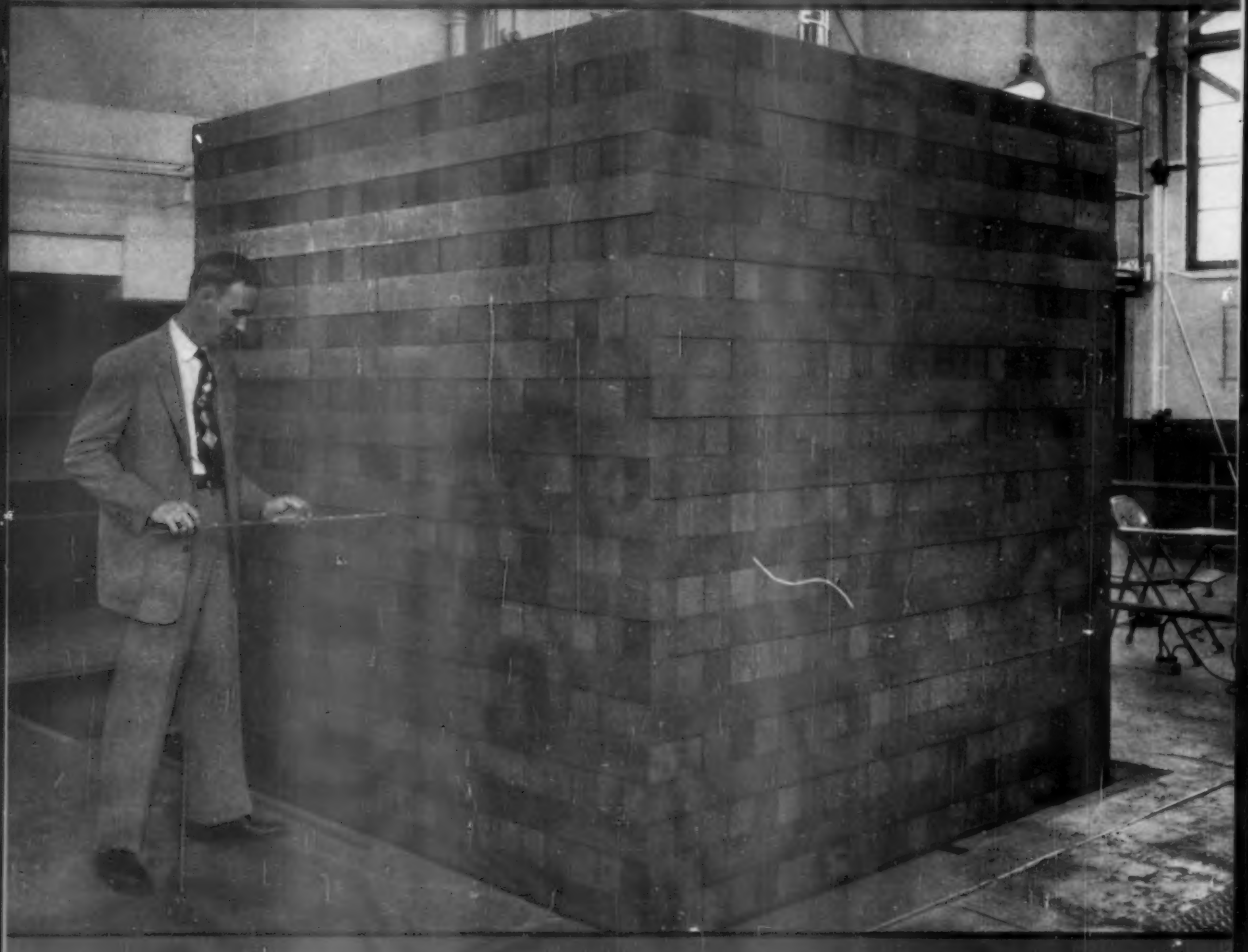
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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See Page 253

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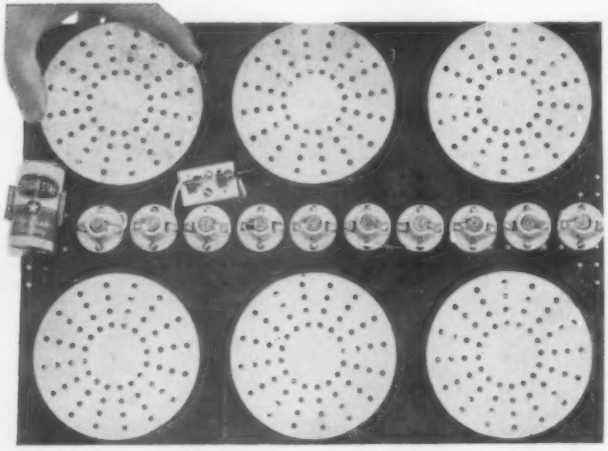

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GENERAL SCIENCE

International Laboratories

Cooperative attack on such problems as conquest of space and control of hydrogen bomb reactions for peaceful production of power urged "to disarm the future."

➤ THREE MAJOR international laboratories to atack such problems as the conquest of space, control of H-bomb reactions to produce power, and weather modification have been proposed by Senator Clinton P. Anderson (D-N.Mex.).

Addressing the Sixth Annual Conference on High Energy Nuclear Physics at the University of Rochester, Rochester, N. Y., the chairman of the Joint Congressional Committee on Atomic Energy urged a halt in the present arms race and a "new try at disarmament" by what he calls "disarming the future."

Areas of technology now in their infancy offer the best hope for international cooperation, he said, because no nation now has a strong vested interest in such fields. To encourage their development, Senator Anderson called for removal of present restrictions on exchange of non-secret scientific information between nations and establishment of a world passport, which would be granted annually to a select list of world-wide nominees by unanimous agreement.

He suggested such world passports might be given to Nobel prize-winners, four of whom attended the conference, outstanding artists, and leaders in religion, government, science and education. They could promote a degree of mutual trust and understanding that might help to halt the arms race and forestall "a war nobody wants," Senator Anderson said.

As prime examples of the many problems that "can and should" be attacked by international efforts, since they do not have respect for national boundaries, he listed launching satellites into outer space, controlling thermonuclear reactions for peaceful production of power and possible world-wide weather modification.

If the race to develop an intercontinental ballistic missile, armed with atomic warheads, ended in a tie between the United States and Russia, Senator Anderson pointed out, "fantastic sums of money, materials and scientific skills" would have been spent on a weapon the people of earth would banish as they did poison gas in World War II.

Since the weapon may never be used, he urged setting aside attempts at space conquest for an international laboratory. Exploration and development of other worlds should be under an organization reflecting the common interests of all peoples of the world.

"The man in the moon," Senator Anderson said, "belongs to the children of every country, is a part of their dream world, and if reached by space ship, might better remain the property of all."

A space missile intended for the moon but landing on another nation's territory because of defective mechanism or planning might touch off the spark of world conflict, if its development were secret, but not if its development were an international effort.

Many programs, he noted, are now being successfully carried forward by joint agreement among nations. Among these Senator Anderson cited the "inspiring scope of the International Geophysical Year," a world-wide effort to probe the earth, its seas and skies, beginning July 1, 1957.

The World Health Organization, he said, is successfully fighting diseases and promoting new understanding of medical care for infants, the aged and the handicapped. The Atoms-for-Peace program, the multitude of activities supported by the United Nations Educational and Scientific Organization, UNESCO, the giant atom smasher being built by several European nations in Switzerland and an internationally run electronic computer are also examples of effective cooperation among nations.

Yet undeveloped technologies may have even more dreadful potentialities for destruction than those now known, Senator Anderson said. Military techniques arising from them can make the present stalemate no worse, since mutual annihilation is now possible.

New fields of science, he urged, can best be developed jointly by all nations. The result might be that a war-weary world would achieve in time a form of disarmament by obsolescence.

Science News Letter, April 21, 1956

PHYSICS

Sub-Nuclear Zoo

➤ A PICTURE of atomic hearts was drawn by more than 200 of the world's leading physicists gathered in Rochester to discuss the past year's important theoretical and experimental developments in nuclear physics.

Three Russian scientists and four Nobel Prize winners were among the more than 200 physicists attending the Sixth Annual Conference on High Energy Physics at the University of Rochester.

During the five-day meeting, the scientists examined the mass of data compiled from atom-smashing and cosmic ray experiments the world over. Their aim was to

INFORMAL EXCHANGE BY PHYSICISTS—One of the two women invited to a conference on high energy physics in Rochester, N. Y., Dr. Sulamith Goldhaber, University of California, is shown here with W. Fry, University of Wisconsin, C. O'Ceallaigh, Institute for Advanced Studies, Dublin, Ireland, D. Glaser, University of Michigan, and K. Gottstein, Max Planck Institute for Physics, Gottingen, Germany.

exchange information on the nature of nuclei.

An atomic core does not have a sharp edge, experiments have shown. It is, rather, like a ball of yarn with a very fuzzy edge or a cloud whose trailing edges gradually disappear into the blue.

Various models of nuclei have been drawn to explain their interactions and reactions. One, the optical model, is known as "the cloudy crystal ball," so-called because when fragments of atoms are hurled at nuclei in giant atom smashers, the result is similar to the diffraction and absorption of light by a cloudy crystal ball.

Bombarding the atom's heart with the various particles to determine its shape and structure can be likened to trying to learn the shape of a house in total darkness by bouncing tennis balls off it.

Subjects covered in the sessions included nuclear forces, mesons and the recently discovered particle of negative matter, the anti-proton, as well as the K-mesons and other particles found hurtling out of nuclei.

Only one new particle, the anti-proton, has been discovered in atomic collision during the past year, the scientists agreed. They expect to find another bit of negative matter, the anti-neutron, shortly.

Bigger and more powerful atom-smashers now being built may answer the question as to whether the anti-neutron will complete the list of fundamental particles, or whether very different kinds of nuclear inhabitants will be discovered at higher energies.

Dr. J. Robert Oppenheimer, director of the Institute for Advanced Study, Princeton, N. J., coined the term "sub-nuclear zoo," to describe the particles which are the "atom's strange offspring."

Prof. G. Wataghin of the University of Turin, Italy, reported that showers resulting from extremely high energy cosmic rays indicate "new ideas" will be required to explain how matter behaves.

About 12 examples of such electronic showers have been recorded. Present theories, he said, fail to explain such events, called Schein showers, because the first was spotted by Dr. Marcel Schein of the University of Chicago.

The largest shower ever recorded, Prof. Wataghin noted, indicated an energy of one billion billion electron volts for the radiation causing it. Hundreds of billions of atomic particles resulted when the cosmic ray smashed into matter high in the atmosphere.

The three Russian physicists, the first to visit the United States since World War II, reported on atom-smashing experiments in Moscow.

Their work "confirms and extends" some studies made in this country, Dr. V. I. Veksler, director of the Lebedev Institute in Moscow, said. Attending the conference with Dr. Veksler were Drs. M. A. Markov and V. P. Silin, also of the Institute.

One atom smasher described by Dr. Veksler is a synchro-cyclotron that operates on a principle he discovered in 1945. Independently and almost simultaneously, Dr. E. M. McMillan, a Nobel Prize winner from the University of California, discovered the same principle. It allows scientists to speed up atomic particles to energies of billions of volts.

At the Conference, Dr. Veksler and Dr. McMillan met for the first time. They talked of progress being made on Russia's ten billion volt accelerator that will be the world's most powerful within a year (See SNL, April 14, p. 227.)

Interpreter for their exchange was Dr. George Volkoff of the University of British Columbia, Vancouver, B. C., Canada.

Science News Letter, April 21, 1956

MEDICINE

Pills for Diabetics

➤ HUMAN TRIALS of pills for diabetics to take instead of insulin are reported by two groups of scientists in *Science* (April 6).

The pills, derived from sulfa drugs, are known as BZ-55 and Orinase.

News that such pills had been developed and might in the future replace insulin injections for some diabetics was previously announced. (See SNL, Feb. 25, p. 115.) The pills are not yet ready for general use.

A "statistically highly significant response" in lowering blood sugar resulted in 34 of 44 patients given Orinase, Drs. I. Arthur Mirsky, Daniel Diengott and Henry Dolger of the University of Pittsburgh School of Medicine report.

The pills were given not as pills but in a solution of bicarbonate of soda the patients swallowed. The 10 patients who did not respond all had developed their diabetes before the age of 20.

The sulfa pills were given to six severe and four mild diabetics by Drs. Laurance W. Kinsell, Frederick R. Brown Jr., Roger Highland Alameda County Hospital, Oakland, Calif.

Of the severe diabetics, three responded W. Friskey and George D. Michaels of favorably, one showed essentially no effect from the sulfa drug, and one had a significant increase in sugar in the urine while taking the sulfa pills.

Three middle-aged very fat diabetics had their insulin requirement reduced more than 50% when taking the sulfa pills.

One patient who had a "pre-clinical" diabetes, that is, who did not show all the signs and symptoms of the disease, had a sugar tolerance curve that the California doctors term "very diabetic." This reverted to normal after a single large dose of the sulfa drug.

Large dosage, the California scientists report, may result in toxic signs. Reducing the dose has so far caused such danger signs to disappear.

The Pittsburgh scientists point out that the usefulness of these drugs cannot be told without extensive trials on patients. Such trials, they state, must be performed with caution.

Science News Letter, April 21, 1956

Besides being an excellent insulating and soundproofing material, *mineral wool* resists fire, corrosion, mold and decay.

Green feeding is an experimental method of harvesting fresh green forage twice daily during the growing season and hauling it to cows kept in a feeding lot.

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PSYCHOLOGY

Race Prejudice Lowered

➤ AN ENFORCED program of on-the-job integration reduces race prejudice among workers.

This is shown in a recent study of racial attitudes among factory and department store employees. The study throws new light on possible approaches to the problems of integration.

The investigation, subsidized in part by the Commission on Community Interrelations of the American Jewish Congress, is reported in *Psychological Reports* (March) by Dr. Ralph H. Gundlach, New York psychologist.

The firms studied, two department stores and two factories in New York City, have integration programs. At each firm, Negroes and whites are required to work together. All the workers at each firm are women.

The programs of integration are operated jointly by the firms and unions involved. Management enforces integration and the unions conduct a sort of information and education program concerning it.

So the workers would not think the poll was being sponsored by management, the survey was disguised as a city-wide opinion poll and was conducted in the workers' own homes. Even the interviewers were not told the nature of the investigation.

One hundred eighteen whites and 28 Negroes were questioned.

When the results were compared with those of an earlier survey at non-integrated plants, workers at the firms with the integration programs were found to have much less anti-Negro prejudice than those at the non-integrated plants. In both the earlier and later studies, Negroes felt many measures were more discriminatory than did whites.

In general, those persons with the "highest culture, education and social aims," the white collar workers, showed the most derogatory and hostile feelings toward Negroes, although this group had contact with similarly cultured and educated Negroes.

In non-integrated firms, about half the white workers questioned thought Negroes should have an equal chance at jobs, while about 45% said they would object to having a Negro working beside them and believed whites should have the first chance at any kind of job.

In the integrated firms, more than 90% of the white workers accepted working beside Negroes as a matter of course. The same percentage thought Negroes should have equal rights in matters pertaining to their jobs.

About two-thirds of the white integrated workers expressed acceptance of Negro supervision over whites. Only four percent of the white workers thought they would be angry enough to leave under these conditions.

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GYROSCOPE FOR SATELLITE — Phillip La Hue, an aeronautical engineer of Minneapolis-Honeywell Regulator Company, uses a child's gyroscope and a spinning model of the earth to illustrate principles involved in operating the HIG, or hermetic integrating, gyro, three of which will be used to guide the rocket pushing the first man-made satellite into its orbit. A gyro always seeks to spin in the axis in which it was set in motion.

AERONAUTICS

Breaking Barriers to Space

➤ MAN will break through the known barriers keeping him from higher altitudes in space, Dr. John R. Poppen, a retired U. S. Navy captain, told the Society of Automotive Engineers' National Aeronautic meeting in New York.

The four barriers now standing between man and outer space are reduced barometric pressure, velocity, vision and radiation.

Each in some way taxes man's physical and mental thresholds, Dr. Poppen said, but "there is no doubt that, as engineering and scientific skills make further progress in flight, possible ways will be found to accomplish human adjustment and the limiting factor will not be human limitations."

Atmospheric barriers, Dr. Poppen noted, can be met by providing pressurized and conditioned compartments with an equable artificial environment. This would solve the problem of having enough oxygen to sustain life and balance the changing temperatures encountered in outer space travel. The pilot would literally travel in a man-made world of his own.

Protective equipment will be designed, Dr. Poppen said, to help man adapt to velocity. Flight, he said, requires a flier to know where he is, where he is going and what he should know to make correct decisions about his actions.

"In this respect," he pointed out, "man has a finite impediment. Speed of vision, time of decision and time of reaction are built-in limitations." Protective equipment will help overcome these limitations, as well as those imposed by gravitational factors.

Vision is still a third barrier. Empty field myopia, for example, Dr. Poppen reported, "results when there is no object in space to provide a reference for focusing the eyes."

This could be overcome, he suggested, by providing an artificial projected image for reference purposes. Other visual barriers can be surmounted by "providing realistic data presentation, direct electronic control and appropriate illumination."

The fourth barrier, radiation, Dr. Poppen said will be reached when man escapes from the earth's blanket of air and is exposed to radiation not found at the surface.

Means for protection are available now, Dr. Poppen reported.

Science News Letter, April 21, 1956

PUBLIC HEALTH

Polio Cases Equal Those in 1955

➤ TOTAL NUMBER of polio cases reported to the Public Health Service for the first three months of this year is almost the same as the number for the same period last year. The figures are 1,072 for 1956 and 1,063 for 1955.

About 26% more cases of paralytic polio were reported this year than last. The figures are 584 paralytic cases this year so far, compared to 464 last year.

This cannot be taken to show anything about the failure or success of the polio vaccine given last year, health authorities pointed out.

About all it does show with respect to the vaccine is that a lot more work is needed before the disease is controlled.

Better information on the total number of cases last year might change the difference between the two years in numbers of paralytic cases, it is pointed out. Last year 29% of cases reported were not specified as to whether they were paralytic or nonparalytic. This year the figure is 18%.

If some of the unspecified cases last year were paralytic, there might have been as many or more paralytic cases showing in the record for the first quarter of 1955 as for that of 1956.

Science News Letter, April 21, 1956

PSYCHOLOGY

Pick Right Child's Toy

➤ PICK THE RIGHT TOY for your child's age if you want it to hold your child's attention for a long time, is the advice of Drs. Kenneth E. Moyer and B. von Haller Gilmer.

The psychologists of the Carnegie Institute of Technology, Pittsburgh, made a study of the holding power of a few especially designed toys, trying them out one at a time on 681 children from 18 months to seven years old.

The toys were first designed, then redesigned and modified to give them high holding power.

One toy, chosen because of its extreme simplicity, was a little red plastic car with white wheels. This little toy caught the eyes of the children and at least the three, four and five year-olds played with it for a few minutes. After three, four or five minutes, although there was no other toy in sight, the youngster would put it down and walk around the room, play with his clothing, hum to himself or try to talk to the observer.

Contrasted with the simple little plastic car was a take-apart airplane. This toy could be taken apart with the simple tools provided, and then could be fitted and bolted together again. The take-apart airplane proved to be not suitable for younger children, but the four, five, six and seven year-olds would be engrossed with it for 30 to 40 minutes at a time.

Close seconds in holding power to the take-apart airplane were two other toys. One was another to take apart and put together, a truck made out of blocks, with other blocks that could be fitted in it for a load. The blocks of the load involve simple puzzle patterns. This toy appealed only to three, four and five year-olds.

The other toy with which the average child would play for 30 to 35 minutes was a wagon with two removable poles and 50 colored chips. The chips had holes in them and could be fitted over the poles or into slots to provide sides for the wagon. The chips and wagon provided an outlet for repetitive behavior, a need of small children. It appealed to ages two to five.

Details of the study are reported in the *Journal of Genetic Psychology* (Dec. 1955).

Science News Letter, April 21, 1956

VOLCANOLOGY

Wrong Volcano Blamed

➤ THE FAMOUS ERUPTION of 1912 attributed to Alaska's Mt. Katmai, one of the most violent natural events in recorded history, was actually another mountain's explosion.

Apparently a neighboring mountain blew its stack, belching volcanic ash that spread over the entire globe, while Katmai's top simply caved in from the shock.

The real villain of this volcanic violence, it now appears from research by two University of California geologists, was Mt. Novarupta, six miles away from Katmai.

In the eruption seven cubic miles of rock and volcanic ash were catapulted out of the earth in only 60 hours, the city of Kodiak a hundred miles away was nearly buried, brilliant sunsets were regular in the Northern Hemisphere, and the temperature of the Northern Hemisphere was lowered more than a degree Fahrenheit for about three months.

So great was the destruction that a scientific expedition could not enter the area until 1916. Then an expedition, led by Dr. R. F. Griggs of the University of Pittsburgh, discovered and named "The Valley of 10,000 Smokes," and examined the terrain.

Mt. Katmai seemed to have blown its top, and volcanic ash lay all around it. It was natural to assume it was Katmai that erupted.

Dr. G. H. Curtis of Berkeley, and his graduate student, Jack Sheehan, come to a different conclusion from new work. They measured the thickness of volcanic ash throughout the entire Valley, recorded measurements on a map, and connected all points of equal depth.

The lines connecting equal thicknesses of ash formed incriminating rings around Novarupta, and none at all around Katmai.

The geologists suggest that there may have been an underground connection between Novarupta and Katmai. The violence of the Novarupta explosion may have caused Katmai to cave in. If Katmai's top had exploded, the scientists would expect to find some large fragments around the crater's rim, and there are none.

Science News Letter, April 21, 1956

INVENTION

Three-Way Iron Awarded Patent

➤ A TRIPLE-THREAT IRON for the American housewife has been invented by Henry Maykemper of Eau Claire, Wis. It permits the housewife to dry iron, steam iron, or sprinkle, all with the same appliance. The flat iron has a built-in reservoir for tap water. Mr. Maykemper was granted patent No. 2,741,044 and assigned the patent rights to the National Presto Industries, Inc., of Wisconsin.

Science News Letter, April 21, 1956

•RADIO

Saturday, April 28, 1956, 2:05-2:15 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Harry Wexler, director of meteorological research, U. S. Weather Bureau, and chief scientist, International Geophysical Year Antarctic Program, will discuss "World Weather."

ENTOMOLOGY

Search for Insect To Kill Halogeton

➤ AN INSECT that will kill halogeton, a fast-spreading poisonous range weed, is being sought by the U.S. Department of Agriculture.

The search by Dr. G. B. Vogt of the USDA Agricultural Research Service will extend into North Africa and the Near East.

Halogeton originated in Asia, where it is not a serious threat to cattle. United States scientists speculate that some Asian insect may be keeping the poisonous weed from spreading. If such an insect were found, it could eliminate the danger of halogeton poisoning for cattle on 9,000,000 acres of Western range land.

Chemical weed killers are considered too costly for general control of halogeton. Effective controls include forage development, range reseeding on adapted sites, and good range management.

Although halogeton has difficulty competing with good range grasses in favorable locations, the weed can grow at high altitudes, in dry areas and in alkaline soils.

Seeds planted in greenhouses have germinated within 15 minutes. In one year a single plant can produce about 25,000 seeds.

Science News Letter, April 21, 1956

MEDICINE

Advises Logistics for Stopping Polio Now

➤ PREVENTING PARALYTIC POLIO is now a problem in logistics, not medical science, Basil O'Connor, president of the National Foundation for Infantile Paralysis, New York, said.

By applying logistics, the supply of vaccine can be used to cut paralytic polio in half in the epidemic period this year and prevent paralytic polio almost completely in 1957, Mr. O'Connor said.

Among suggestions he made for doing this are the following:

Parents of children in the 0 to 19 age group will have the vaccine given to their children when and as it becomes available and not wait until June when its administration to such a large group will present insuperable practical difficulties.

Local public health officials and doctors will let the public know promptly when vaccine is available.

Science News Letter, April 21, 1956

"SPARROW I" GUIDED MISSILE—Jet fighter planes of the U. S. Navy are now equipped with the air-to-air supersonic guided missiles known as "Sparrow I's." This photograph shows a Chance-Vought F7U-3M "Cutlass," after carrier launching, equipped with airborne guidance gear developed by the Bureau of Aeronautics and Sperry Gyroscope Company to direct the missiles singly or in groups.

GENERAL SCIENCE

Russia's Air Scientists

➤ SOME of Russia's aeronautical scientists are as good as any in the world, but they are only a small, hard core of highly trained men atop a shaky engineering pyramid.

This is the conclusion of a Massachusetts Institute of Technology study on the current state of Russia's aeronautical science.

The few top air scientists have solved a number of theoretical problems singled out to keep Soviet air science neck and neck with any competitor in the present development race, the report states, but they are perched on a shaky base.

"The full cross section of engineers in the Soviet Union," says Dr. Leon Trilling, assistant professor of aeronautical engineering at M.I.T., who prepared the report, "have apparently not yet acquired that degree of engineering 'feeling' which only broad familiarity with machinery can bring. They work by book and require detailed direction."

This factor, Dr. Trilling explains, results in excellent designs being adapted to "inferior execution," and tooling and high-grade workmanship saved for only key parts of the design.

Aeronautical engineering, he states, probably represents the Russians' best effort in engineering. Education received by Soviet engineers stresses service to the State.

"On the basis of the evidence," says Dr. Trilling, "it is our conclusion that there exists in the Soviet Union a group of talented people with drive and ambition who are generally permitted to reach the top, sometimes quite rapidly, and that their number has increased as a direct result of Soviet educational policy.

"But there are still only a few men who carry the Soviet engineering apparatus on their shoulders, being simultaneously teachers, scientists, and designers.

"There can be little doubt that the ability and knowledge of this key nucleus is on a par with that of the best men in similar positions anywhere, but that at the present time these men do not have adequate support."

Science News Letter, April 21, 1956

MARINE BIOLOGY

Squid Squirts Ink as Decoy

➤ THE SQUID, a ten-armed sea creature similar to the octopus, ejects blobs of ink in the water to serve as a decoy, a British scientist has learned.

The squid does not eject a large cloud cover of ink as is usually supposed. Observations at the Regional Fisheries Research Station, Singapore, show that a squid puts out just enough ink to color a volume of water its own size.

An enemy in pursuit often mistakes the ink for the squid. Meanwhile the squid, which can change color at will, becomes pale and makes a getaway, Dr. D. N. F. Hall reports in *Nature* (April 7).

Science News Letter, April 21, 1956

EDUCATION

Nobelist Says America Has Unused Geniuses

➤ AMERICA has hundreds of potential scientific geniuses whose talent will never be used, Dr. Glenn T. Seaborg, Nobel Laureate and co-discoverer of plutonium, said in San Francisco.

"In addition, among the young people of our country today there are many thousands, perhaps tens or hundreds of thousands, who could become very successful scientists and engineers, who will never do so because they fail to receive the initial inspiration to consider seriously trying their hands in this field," Dr. Seaborg said.

The scientist stated that, in view of the very great important science assumes in our daily lives, "the neglect of scientific disciplines in the pre-college school system presents one of the big paradoxes of present-day American society."

Dr. Seaborg said that the high school system is failing to fulfill its functions in preparing young people for science careers, and that the colleges and universities should considerably increase their teaching of science.

He spoke at the presentation of the Bay Area Outstanding High School Chemistry Teacher Award of the San Francisco Chapter of the Armed Forces Chemical Association. Winner of the award was Robert Rice, Berkeley High School teacher.

Science News Letter, April 21, 1956

PUBLIC HEALTH

Smog Hits Top From November to January

➤ THE SMOGGIEST MONTHS in Berkeley, Calif., are November, December and January, Dr. Bernard D. Tebbens of the University of California School of Public Health has found.

Tuesdays and Fridays are the worst days of the week, and Sunday is the cleanest.

Noontime most often brings the highest peaks of air pollution during the day.

The smog measurements, made with a smoke sampler that measures how dirty the air is at two-hour intervals, are reported in the journal, *Air Repair*. Dirty spots on long reels of filter paper exposed to the atmosphere record the amount of pollution.

Meaning of the findings is not yet clear, Dr. Tebbens said, but several lines of research are suggested.

For example, since automotive travel and industrial activity do not increase to a peak at noon and then taper off, weather conditions may account for the hourly differences. Yearly peaks may also be due to weather.

Weather changes, however, could not explain why the air is consistently dirtier on certain days than others, nor why Sundays are the cleanest. Reasons for this must come from a study of air pollution sources.

Science News Letter, April 21, 1956

BIOLOGY

Living High Tough on Females

➤ LIFE at high altitude is tough on mice, especially the females.

This is one of the findings of a University of California physiologist, Dr. S. F. Cook, who is attempting to learn more about the physical effects of thin atmosphere at high elevation.

Dr. Cook reported on experiments in which he bred mice at the 10,150-foot level at the University's White Mountain High Altitude Research Laboratory, and also in a low-pressure chamber set for an atmospheric pressure of 15,000 feet.

He continued his experiments for 12 generations at White Mountain and six generations in the pressure chamber. With each generation the adaptability of the animals to high altitude stress declined. Reproductive rate fell, growth was retarded, and there were changes in liver functions.

When the animals were returned to sea level, they became normal, or almost normal, in a single generation. Whatever the cause of the change at altitude, it was not considered a matter of heredity.

Dr. Cook said the males, while they became relatively sterile, maintained a good state of general well-being. Females, on the other hand, have a harder time, they abort readily, and their litters are of poor quality.

Dr. Cook said the double stress of pregnancy and high altitude may account for the harder time females have.

Science News Letter, April 21, 1956

ORNITHOLOGY

Build Your Own Tin Can Bird House

➤ TIN CAN NEST BOXES attract tree swallows, as well as other birds, it was found in experiments conducted at the University of Wisconsin arboretum.

Two-quart cans are best for these nests, according to Robert S. Ellarson, the university wildlife management specialist who conducted the tests. These cans can be obtained from restaurants or other places that buy canned fruits and vegetables in quantity.

An entry hole one and one-half inches in diameter should be cut two-thirds of the way up the can. The edges of the hole should be bent over or filed smooth.

The top cover of the can should be cut off completely. A wooden lid should then be cut so that it projects about an inch in front and one-half inch at the sides.

Two screw-eyes, projecting downward from the bottom of the lid, one on each side of the can, make it possible to hold down the lid by passing a heavy wire through the eyes and through holes punched in the sides of the can. Using this method, the lid can be removed for cleaning the nest in the fall.

Another wire, passed through holes punched about two-thirds of the way up the can in the back, will serve to hold the can firmly to its support.

The can should then be painted green, after which it is ready for bird housekeeping.

Mr. Ellarson said that if tree swallows are wanted as occupants, the can should be placed on a post in an open area, where there are few trees or shrubs. He explained that if the nest is placed too close to trees or brush, wrens are more likely to use it and may even break up a nest started by tree swallows.

Of course, other birds will use the can nests, too, if they happen to get there first and are tough enough to defend their new home.

Of 65 can nests placed by Mr. Ellarson, tree swallows nested in 42. Wrens and bluebirds used the others.

He suggested the can nests be placed as early as possible, because tree swallows at least start looking for a home in early spring. If the birds find the nest and its surroundings to their liking, Mr. Ellarson said, they will return again.

Science News Letter, April 21, 1956

ENTOMOLOGY

Worm Sides With Man Against Insects

➤ WORMS so tiny that an army of them can live in one cubic foot of soil will soon be fighting on the side of man in the battle against insects.

The worms are a species of nematode, normally a destructive parasite which yearly costs the United States more than half a billion dollars in crop losses. The helpful species of nematode, however, does not harm plants or animals.

U. S. Department of Agriculture entomologists expect the useful nematode to be a valuable ally because it carries bacteria that quickly kill insects, can survive most insecticides and fungicides, and is hardy.

The disease spread by the nematode has proved deadly to at least 30 insect species, including the costly boll weevil and codling moth.

The nematode larva is a silent, efficient fighter. He crawls into an insect's mouth, penetrates its intestinal wall, discards the sheath in which he has been encased, and injects the fatal bacteria. Within two to three days the insect is dead.

Conveniently, the worm's weapon also serves as his food. The nematode eats the decomposed bodies of the bacteria which kill insects.

Like good soldiers everywhere, nematodes in the larval stage can survive extremes of heat and cold, can go without food for long periods, and can travel considerable distances in search of prey.

The Department of Agriculture has devised a method of mass propagation of nematodes. A large number will be needed for field tests.

Science News Letter, April 21, 1956

IN SCIEN

CHEMISTRY

Air-Refreshing Chemical Made Commercially

➤ THE CHEMICAL filling the canisters that allow divers and fire fighters to breathe where there is no air is now made in quantity.

A fine-grained yellow powder, a superoxide of the metal potassium, absorbs carbon dioxide and gives off the oxygen needed to sustain life.

Moisture in the breath is sufficient to keep this chemical interchange going, so that a man can carry in his respiration canister a continually operating air re-conditioner.

Use of the chemical to keep air supply breathable under conditions of extreme exercise" was reported by Dr. C. B. Jackson of the Mine Safety Appliances Co., Callery, Pa., at the American Chemical Society's division of industrial and engineering chemistry meeting in Dallas, Tex.

Dr. Jackson also described the process, developed by himself and Dr. R. C. Werner, for making the superoxide by atomizing molten potassium with air.

A continuous process for making the pure potassium metal and alloys of potassium and sodium of any desired composition was described at the same meeting by Dr. Werner. Sodium vapor and molten potassium chloride are used to produce the light metals.

Science News Letter, April 21, 1956

TECHNOLOGY

Fence Post Preservative Developed for Home Use

➤ IF YOU, like thousands of other United States home owners, have been plagued each year or two with rotting fence posts, you will probably welcome the preservative process developed by the U. S. Department of Agriculture.

The method gives protection against termites as well as decay.

The process consists of soaking fence posts in two solutions, one of copper sulfate, the other of sodium chromate.

The posts should be soaked two days in 18 pounds of copper sulfate crystals dissolved in 24 gallons of water, and one day in 18 pounds of powdered sodium chromate dissolved in 26 gallons of water.

The two chemicals combine in the wood and form copper chromate. Copper chromate is deadly to fungi and insects, practically insoluble in water, and will remain in wood even though the posts may be in damp soil.

The chemicals are poisonous and can cause irritation to unprotected skin.

Science News Letter, April 21, 1956

CE FIELDS

AERONAUTICS

Atomic Planes in 1959 And Aerial Locomotives

➤ ATOMIC-POWERED military aircraft should make their appearance in three years, and atomic-powered commercial aircraft in ten years, Lee A. Ohlinger of Northrop Aircraft, Inc., predicted in New York.

Tomorrow's atomic airliners, he told the Society of Automotive Engineers' National Aeronautic meeting, will be "locomotives of the sky." The "engine" would be a giant atomic-powered fuel-plane. The "coaches" would be smaller ships coupled in mid-air to the locomotive.

With this set-up, Mr. Ohlinger said, indefinite shuttle service could be maintained, limited only by the crew's endurance.

The airborne nuclear train would fly its course, with commercial airliners "unhooking" on arrival at their terminal airport, where other passenger aircraft would "latch on" for new airports of call.

Airliners or air freighters, thus relieved of carrying full fuel loads, Mr. Ohlinger said, could haul larger passenger and pay loads. The tow plane concept, he said, also solves the problem of shielding passengers from radiation emitted by a nuclear engine.

Mr. Ohlinger foresaw a military application of atomic aircraft by what he called "Project Opossum," in which an atomic-powered, supersonic bomber would carry a fighter escort on its back, much like a female opossum carries her young.

When on target or attacked, the bomber would launch its fighters to set up a defensive screen.

Science News Letter, April 21, 1956

STATISTICS

American Women Now Are Younger Mothers

➤ AMERICAN WOMEN today are marrying and becoming mothers at a younger age than their mothers did.

These two facts are the reasons for the increase in the number of the nation's children during the last ten years and not the popular belief that large families are back in fashion, P. K. Whelpton, director of the Scripps Foundation for Research in Population Problems at Miami University, Oxford, Ohio, reports.

About 50% of the women reaching ages 20 to 24 had already married in 1915, as compared to 60% for the same age group in 1945 and 70% in 1955.

Among these married women, Mr. Whelpton reports, the percentage childless declined from about 27 in 1945 to 17 in 1955. This decrease, he states, was almost exactly balanced by an increase in the percentage with two children from about 20 in 1945 to 29 in 1955.

The picture is very similar for married women aged 25 to 29, Mr. Whelpton states. Whereas one-fifth of these women were childless in 1945 the figure has dropped to one-tenth today. One-child families have also become less common, decreasing from one-third of all families in 1945 to one-fourth at present.

In most cases these changes mean a shift to two- or three-children families. There has been little increase in those with five or six children.

Science News Letter, April 21, 1956

PUBLIC HEALTH

Predicts Continued Hospital Cost Rise

➤ HOSPITAL COSTS will continue to rise at about five percent a year for many years, Ray E. Brown, president of the American Hospital Association, predicted in Chicago.

Personnel salaries are the crux of the problem. These must be increased as general salary levels increase. Hospitals, however, are service institutions with little or no opportunity to increase income by making a product that can be sold, he explained.

Before World War II most hospital employees were women and the lack of competition for female help kept hospital wage scales low.

Increases in hospital services calling for added equipment and personnel are another factor in the rising cost picture, Mr. Brown said. The number of routine procedures per patient day has increased more than 30% in the past nine years.

Science News Letter, April 21, 1956

MARINE BIOLOGY

Sea Creature Spits Up Offspring When Crowded

➤ AN ARCTIC SEA CREATURE that spews offspring out of its mouth when it gets in trouble has been reported by Prof. G. E. MacGinitie, principal investigator of ocean fauna at the Navy's Arctic Research Laboratory at Point Barrow, Alaska.

The peach-colored, plant-like invertebrate, a sea anemone related to coral polyps, concerns itself chiefly with preserving its species when it gets in trouble.

"When it was subjected to unfavorable conditions, such as over-crowding in a pan or jar of sea water," Prof. MacGinitie said, "it cast out through the mouth a translucent white inner lining, with translucent, stubby tentacles. This offspring was somewhat suggestive of a pickled onion. If conditions remained adverse, more offspring were cast off, each one becoming smaller than its predecessor."

When immature specimens of these offspring were first dredged from the sea bottom, they were mistaken for a new species, Prof. MacGinitie reported to the Smithsonian Institution.

Science News Letter, April 21, 1956

ENTOMOLOGY

"Yale" Butterflies Released in Florida

➤ A BUTTERFLY caught this spring with the word "Yale" stamped on its wings is not a college gag. It is part of a study by Yale University scientists.

They are trying to find the route and travel speed of the orange and brown Monarch butterfly. The butterfly is thought to migrate northward each spring.

It is known to wing southward in the fall and settle down in Florida and even the West Indies, the same as people and birds. Much less is known about the return trip north.

In an attempt to answer some of the questions about the Monarch's flight plans, Dr. Charles L. Remington, a Yale zoologist, and his wife Jeanne, have been tagging Monarchs in Florida with the word, "Yale."

It is hoped that the tagged Monarchs, if caught, will be sent to Yale with a report of the place and time of capture.

The study may lead to an attempt to find the mechanism that causes the butterflies to travel.

Science News Letter, April 21, 1956

AERONAUTICS

Pilot Errors Cause Air Force Accidents

➤ PILOT ERRORS were the greatest cause of U. S. Air Force accidents in 1955, Col. H. G. Moseley, chief of the Air Force's Aero Medical Safety Division, told the Society of Automotive Engineers' National Aeronautic meeting in New York.

Of the "cause determined" accidents in 1955, Col. Moseley reported, 67% could be blamed on the human factor. This figure includes pilot error, as well as maintenance and supervisory errors.

"Pilot error," Col. Moseley explained, does not necessarily imply any neglect or fault on the pilot's part. The pilot, he said, sometimes makes errors leading to aircraft accidents as a result of poor physical conditions, by having his physiological tolerances overwhelmed or due to irregularities in behavior.

However, most pilot errors, he said, are due to the pilot's inability to meet the routine demands of flying, and this inability is due to understandable causes.

These causes he listed as unfamiliarity with the aircraft, derelictions in attention, improper attitudes, faulty aids in flying and other distractions.

Col. Moseley expressed surprise that there were not more unsafe acts committed by pilots than there are. He said pilots today are functioning in an environment and under circumstances that have no present or historical comparison.

The Air Force medical officer said most of the causes for accidents could be remedied.

Science News Letter, April 21, 1956

ASTRONOMY

Venus Now Most Brilliant

The planet Venus, which can be seen during daytime if correct region is viewed, reaches its brightest on May 15. Mars is now brightening.

By JAMES STOKLEY

➤ ALTHOUGH Venus is swinging back toward the sun, the planet is still brightening, and will reach greatest brilliance on May 15.

Thus, it is by far the most prominent star or planet seen on May evenings. As dusk falls, it is toward the west, becoming visible easily even while there is still considerable daylight.

However, this is not the only planet now visible. Mercury, which moves about the sun in an orbit even smaller than that of Venus, makes a brief appearance at the beginning of May. On the second it is farthest east of the sun, setting well after sunset, although before twilight has ended.

This affords the year's best opportunity for a glimpse of this seldom-seen orb. It will be in the constellation of Taurus, the bull, below Venus, but only about a fortieth as bright.

During the first four or five days of May, it will be possible to locate Mercury without great difficulty — provided, of course, you have an unobstructed view toward the west.

Other Evening Planets

The other evening planets are much more easily located. The brightest, after Venus, is Jupiter. This stands in the southwest, in the constellation of Leo, the lion, close to the little group known as the sickle, which is shown on the accompanying maps.

These depict the sky as it appears about ten o'clock, your own kind of standard time, at the first of May, or nine o'clock at the middle of the month. (Add one hour for daylight saving time.)

Low in the southwest we can see Saturn, in Scorpius, the scorpion, which is just coming above the horizon for its summertime appearance. Saturn is a little fainter than Mercury, although it may seem brighter since it will be visible against a dark sky background.

Among stars of a May evening, the brightest is Vega, in Lyra, the lyre, visible in the northeast. Below Lyra can be seen part of Cygnus, the swan, with the star Deneb, also of the first magnitude.

Despite this, Deneb's low altitude in the sky causes a greater absorption of its light, which makes it appear somewhat fainter. The same thing is true for the star Antares, in Scorpius, the scorpion, which is a little below Saturn.

High in the southwest, at the end of the handle of the sickle of Leo, and just to the left of Jupiter, we find Regulus. Next-door to Leo, toward the left and a little lower, is the figure of Virgo, the virgin, and in it stands the star called Spica. And just above the eastern end of Virgo can be found Bootes, the bear-driver, with brilliant Arcturus.

Another way of locating Arcturus is from the great dipper, part of Ursa Major, the Great Bear, which now is high in the north. If the curve formed by the dipper's handle is followed toward the south, it brings you to Arcturus, and then to Spica.

Two of the bright stars that decorated the winter evening skies are still seen in the west. One is Pollux in Gemini, the twins, the group in which Venus is sojourning. The other is Procyon, in Canis Minor, the little dog, to the left.

Later on May nights the planet Mars appears for a few hours before sunrise, shining brightly in the southeast. This summer it will be seen in the evening sky, getting ready for its close approach to the earth in September.

Because Venus moves around the sun in an orbit that is inside the one in which the earth moves, it sometimes comes between sun and earth, while at other times it is on the far side of the sun. As a result, it changes phase in the same way as the moon.

When Venus is out beyond the sun and its entire sunlit hemisphere is presented to our view, it is seen as a complete circle, like the full moon. But now it is nearer than the sun, and we can see less than half of the hemisphere on which the sun is shining. So, if you were to look at it through a telescope, you would see that it has a crescent phase, like the moon five or six days after new.

At the same time it is approaching closer and closer. This makes it brighter for a time, but in June, when it comes almost directly between earth and sun, the crescent will become so narrow that it will be dimmed considerably. Maximum brightness comes on May 15, when it reaches magnitude minus 4.2.

See Venus During Day

Under these conditions, Venus can be seen in broad daylight, provided you know just where to look. On May 8 it will be just south of the moon, then a crescent three days old. Look toward the south in the afternoon, and you may be able to locate it.

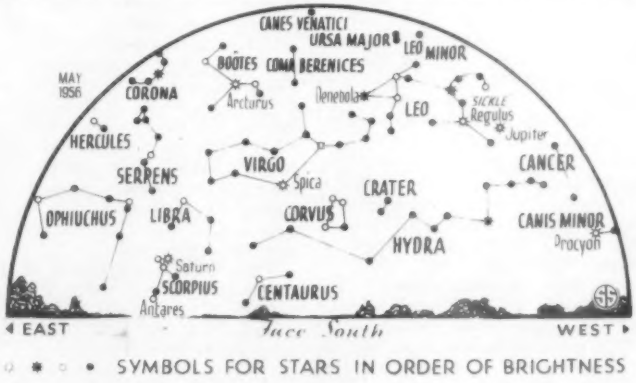
Sweeping back and forth across the sky with a pair of binoculars may help.

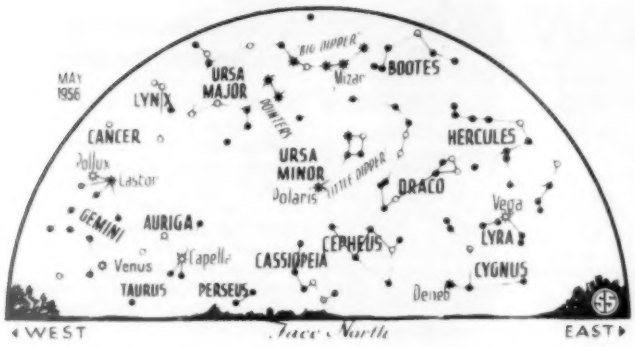
It is probable that glimpses of Venus under such conditions have given rise to, and kept alive, the ancient and mistaken notion that stars can be seen in daylight by looking at the sky from the bottom of a well or a high chimney. Such a belief is very widely held among laymen, and even by some scientists, and it has been traced back to the time of Aristotle.

In 1950, when Vega passed directly over Columbus, Ohio, Dr. J. Allen Hynek, professor of astronomy at Ohio State University, took a group of his students into an unused chimney 235 feet high. All they saw was the bright spot of sky, with no sign of the star.

Even more elaborate experiments were made in 1954 by Dr. Alex G. Smith of the department of physics at the University of Florida. He made brightness measurements and took photographs from the bottom of a 157-foot chimney and also, for comparison, from the open at about the same time.

At night we see a star because it is much brighter than the dark sky background, but in the daytime the sky itself





is so bright that the additional brilliance of the star makes no appreciable difference.

It would still be conceivable that, with the eyes shielded from the glare of surrounding light, they might become more sensitive to contrasts in brightness, and that this might help.

However, numerous experiments by psychologists have shown that the eyes are actually less sensitive to such contrasts, when viewing a small luminous area surrounded by darkness. They are most sensitive when the surroundings are as bright as the area of the test.

Dr. Smith, in fact, found that, when the star Pollux was visible overhead at twilight, it was harder to see when he observed it from the bottom of the chimney than when he was outside!

Thus, he concludes in a report of his work published in the *Journal of the Optical Society of America* (June, 1955), "the common belief in the daylight visibility of stars through such a shaft is without real foundation." (See SNL, July 9, 1955, p. 24.)

Celestial Time Table for May

May	EST	
2	5:00 p.m	Mercury farthest east of sun—visible around this date low in west just after sunset.
	9:55 p.m.	Moon in last quarter.
	11:19 p.m.	Moon passes Mars.
10	8:04 a.m.	New moon.
12	8:00 p.m.	Moon nearest, distance 226,300 miles.
13	8:11 a.m.	Moon passes Venus.
15	9:00 p.m.	Venus at greatest brilliance—magnitude minus 4.2.
16	9:59 p.m.	Moon passes Jupiter.
17	12:15 a.m.	Moon at first quarter.
20	9:00 a.m.	Saturn at closest for year, distance 832,300,000 miles.
24	3:34 a.m.	Moon passes Saturn.
	10:26 a.m.	Full moon; partial eclipse of moon as it enters partly into earth's shadow, visible in Asia, Australia and Antarctica.
25	7:00 p.m.	Mercury between earth and sun.
28	4:00 p.m.	Moon farthest, distance 251,900 miles.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, April 21, 1956

CHEMISTRY

Fats Not Used for Soap Are Source of Chemicals

➤ FATS, which become too plentiful as detergents displaced soap on the market, are now in increasing demand as chemical sources in manufacture of surface coatings, plastics, lubricants, cutting oils and even detergents themselves.

Treatment with nitric acid changes fats to materials taking an active part in a wide variety of chemical processes, making such products a "master key to the great variety of their industrial outlets."

Such applications were explained to members of the American Chemical Society meeting in Dallas, Tex., by Dr. Miles R. McCorkle of Armour and Co., Chicago. Dr. McCorkle spoke at a symposium on industrial applications of fatty acids.

At the same meeting, Dr. Waldo C. Ault, Eastern Regional Research Laboratory, Philadelphia, told of the availability, cost and composition of animal and vegetable fats and tallow oil as chemical raw materials.

Dr. Ralph H. Potts, Armour Chemical Division, McCook, Ill., described continuous processes, automatically controlled, for converting fats from such sources into a variety of chemical products. He stressed the proper materials to be used in these automatic plants to avoid corrosion by the fatty acids formed.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

DIFFERENTIAL CALCULUS—W. L. Ferrar—*Oxford University Press*, 296 p., $4.40. A college text for students of mathematics and science.

DOCTORS AND WHAT THEY DO—Harold Coy—*Franklin Watts*, 183 p., $2.95. A former newspaper writer tells young people about the everyday work of a doctor.

ELECTRONICS: An Introduction for the Non-Technical Reader and Student to All Aspects of Electronics in This Modern Age of Science—A. W. Keen — *Philosophical Library*, 256 p., illus., $7.50. Information you need in order to understand such modern gadgets as radar, television and transistors.

ELECTRONICS IN MANAGEMENT — Lowell H. Hattery and George P. Bush with foreword by Catheryn Seckler-Hudson—*University Press of Washington, D. C.*, 207 p., $6.00. Summarizing advanced thinking about management implications of electronic computers.

ESSAYS ON SCIENCE — Herman Augustus Spoehr — *Stanford University Press*, 220 p., illus., $5.00. Presenting the observations of a thoughtful man on the changing state of his chosen field.

ESSENTIALS OF QUANTITATIVE ANALYSIS: An Introduction to the Basic Unit Operations—A. A. Benedetti-Pechler — *Ronald*, 666 p., illus., $15.00. A text adaptable to almost any level of instruction and a reference work for practicing analysts.

EXPERIMENTAL CONCRETE PAVEMENTS — Walter T. Spencer and others—*Highway Research Board, Bulletin* 116, 71 p., illus., paper, $1.35. Reporting investigations to determine the relative performance of various thicknesses of sub-bases under pavement of portland cement concrete.

GENERAL BOTANY—William T. Taylor and Richard J. Weber—*Van Nostrand*, 376 p., illus., $5.75. A physiological approach to plant organisms.

INTRODUCTION TO BIOLOGICAL SCIENCE: A Study of the Human Body and of the World of Plants and Animals—Clarence W. Young, G. Ledyard Stebbins and the late Frank G. Brooks—*Harper*, 555 p., illus., $4.75. Text for a one-semester general course, with emphasis on human life and the relation between man and the organic world.

MICROBIOLOGY: General and Applied—William Bowen Sarles, William Carroll Frazier, Joe Bransford Wilson and Stanley Glenn Knight—*Harper*, 2d ed., 491 p., illus., $5.75. Emphasizing the application of microbiology to agriculture, industry and the home, with some attention to disease production and immunity.

1999: Our Hopeful Future—Victor Cohn—*Bobbs-Merrill*, 205 p., illus., $3.75. A science writer predicts what the future will be like.

PIECING TOGETHER THE PAST: The Interpretation of Archaeological Data—V. Gordon Childe—*Praeger*, 176 p., illus., $3.95. Based on a series of lectures devoted to the principles of archaeological classification and its implicit interpretative concepts.

PLANT PROPAGATION AND GARDEN PRACTICE: A Practical Guide to the Various Methods of Propagating Trees and Shrubs, Herbaceous Plants, Fruits and Vegetables—R. C. M. Wright with preface by T. J. Walsh—*Criterion*, 192 p., illus., $4.50. A practical reference book for the gardener.

RADIATION BIOLOGY: Volume III, Visible and Near-Visible Light—Alexander Hollaender, Ed.—*McGraw-Hill*, 765 p., illus., $10.00. This volume can be used as a separate work, but the author recommends that the three volumes be read as a unit. This volume is the third and final one in an authoritative set published under the sponsorship of the National Research Council.

RADIOACTIVE DEPOSITS IN NEW MEXICO—T. G. Lovering—*Govt. Printing Office*, Geological Survey Bulletin 1009-L, 75 p., illus., paper, 70 cents. Deposits in the northwestern part of the state seem the most promising for mining uranium ore.

RAPID CALCULATIONS—A. H. Russell, with a foreword by Sir E. John Russell—*Emerson*, 287 p., $2.95. Presenting short-cuts and time-saving tricks that may make any reader into a "lightning calculator."

URANIUM-BEARING NICKEL-COBALT-NATIVE SILVER DEPOSITS, BLACK HAWK DISTRICT, GRANT COUNTY, NEW MEXICO—Elliot Gillerman and Donald H. Whitebread—*Govt. Printing Office* Geological Survey Bulletin 1009-K, 29 p., illus., paper, 65 cents.

THE WORLD OF PLANT LIFE—Clarence J. Hylander—*Macmillan*, 2d ed., 653 p., illus., $8.95. Plants are not only the oldest of living things, but they are also the largest, the trees, as well as the smallest, the bacteria.

WORLD SURVEY OF EDUCATION: Handbook of Educational Organization and Statistics — *UNESCO (Columbia University Press)*, 943 p., illus., paper, $14.00. To help the educator to understand educational systems in other parts of the world. Published in English and French.

ZOOGEOGRAPHY OF WEST INDIAN LAND MAMMALS—George Gaylord Simpson—*American Museum of Natural History*, Novitates 1759, 28 p., paper, 25 cents. The West Indies are extremely poor in living native land mammals. The animals discussed here are for the most part extinct, although recently so.

Science News Letter, April 21, 1956

ANATOMY

Liver Cancers Support Evolution Theory

➤ THE THEORY of human evolution from lower forms of animals gets support from a study of human liver cancers.

The study was reported by Dr. Hans Elias of the Chicago Medical School, Chicago, at the meeting in Milwaukee, Wis., of the American Association of Anatomists.

Every form of human liver cancer, he finds, has its counterpart in the embryonic or adult liver of some vertebrate animal.

Some human liver cancers have the kind of cells found in the liver of turtle embryos. Some liver cancers of humans have masses like those in snake embryo livers. Structures called trabeculae found in human liver cancers are like those in pig embryo livers. There are little tubes in some human liver cancers like the little tubes in livers of embryos of sharks, alligators and song birds. There are duct-like structures such as are seen in chick embryo livers. Spindle cell masses in human liver cancers find their counterpart in marsupial, rat and primate embryo livers.

Science News Letter, April 21, 1956

VETERINARY MEDICINE

Red Blood Count Points To Race Horse Fitness

➤ OWNERS AND TRAINERS of race horses can get a good idea of whether or not a horse is at its physical peak for racing by having a count of the horse's red blood cells made.

Race track veterinarians, moreover, should make routine studies of the red blood cell count and hemoglobin of all racing thoroughbreds as part of the routine care and advice they offer.

These conclusions of Dr. H. C. Brenon of the Brenon Laboratories, Inglewood, Calif., are based on his study of 207 normal thoroughbred racing horses working at Hollywood Park, Ingleside, Calif.

This is believed the first study of the blood picture of thoroughbred horses, although the blood count and hemoglobin of horses in general have been studied before.

Averages for the 207 thoroughbred horses were 6.8 million red blood cells per cubic centimeter of whole blood and 13.7 grams of hemoglobin per 100 cubic centimeters of whole blood, disregarding age and sex.

A high blood count, Dr. Brenon found, may be a factor in running ability. Any red blood cell count running below 6.3 million seems to point to an abnormal condition affecting the horse's running ability, although the horse may otherwise appear fit.

All horses with counts below this figure either ran out of the money or were not raced during the period under test, Dr. Brenon learned by checking the racing records of the horses. His study is reported in the *Journal of the American Veterinary Medical Association* (April 1).

Science News Letter, April 21, 1956

PHYSICS

Original Atomic Pile Rebuilt Three Times

See Front Cover

➤ THE ORIGINAL uranium and graphite used by the late Dr. Enrico Fermi and his associates in the world's first nuclear reactor have been used in the exponential assembly, or subcritical reactor, shown in the photograph on the cover of this week's SCIENCE NEWS LETTER, which was recently constructed at Argonne National Laboratory, Lemont, Ill.

The exponential assembly is an eight-foot cube that contains 30 tons of graphite into which two and a half tons of uranium have been placed in a pre-determined lattice-type arrangement.

By measuring the amount of induced radiation in indium foils placed in the reactor, as Vincent H. Shoemaker demonstrates, it is possible to obtain information needed for the design of full-scale reactors.

The original reactor, after its initial operation at West Stands, Stagg Field, University of Chicago, was dismantled and reassembled at a remote site southwest of Chicago where it contributed useful information to the atomic energy program for more than a decade.

In 1955, it was again dismantled and much of its uranium and graphite have been used in the construction of this exponential assembly.

Science News Letter, April 21, 1956

BIOCHEMISTRY

Amino Acid Helps TB Germs Invade

➤ ABILITY of the tuberculosis germ to infect humans may be related to the level of glutamic acid, one of the protein building blocks and life's most abundant amino acid.

The strain of TB bacteria that infects humans has considerably higher levels of glutamic acid than non-infective strains of the bacteria, Dr. Max Dunn, Ben Ginsburg and Sarah Lovett, University of California at Los Angeles biochemists, found.

Glutamic acid content of a human virulent strain exceeded that of non-infective strains by an average of more than 50% and that of 10 other types of bacteria by nearly 70%.

Glutamic acid is the most abundant of the amino acids in life, Dr. Dunn points out. The significantly higher content in virulent TB organisms points toward a relationship to the organism's virulence, he adds.

"If we can find a chemical antagonist for glutamic acid, a substance that will block glutamic acid activity in the chemistry of the virulent organism, it may lead to a more effective therapy for the disease," he said. "Promising experiments along this line are being carried out."

Science News Letter, April 21, 1956

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OF THE XVIII CENTURY

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★★★ **MOZART: Complete 6 String Quintets;** Pascal String Quartet with W. Gerhard, viola
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★ **DEBUSSY: Quartet in G;** Pascal String Quartet. **Sonata for Flute, Viola and Harp;** C. Larde, flute; C. Lequien, viola; M. Jamot, harp • **Sonata for Violin and Piano;** O. Colbentson, violin; E. Ullmer, piano
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★ **MOZART: 3 Salzburg Serenades (K. 136, K. 137, K. 138);** Boyd Neel Chamber Orch ; W. Goehr, cond.
★ **HINDEMITH: Sonata for Trumpet and Piano;** H. Sevenstern, trumpet; H. Duval, piano • **Sonata for Viola and Piano;** F. Tursi, viola; J. Echaniz, piano **Sonata for Clarinet and Piano;** Jos. D'Inndt, clarinet; H. Duval, piano • **Sonata for Bassoon and Piano;** A. Swillens, bassoon; H. Duval, piano
★ **DVORAK: Piano Quartet in E Flat, Op. 87;** A. Balsam, piano; P. Rybar, violin; B. Korner, viola; A. Tusa, cello • **Trio in F, Op. 65;** L. Kaufman, violin; A. Balsam, piano; M. Cervera, cello

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★★ **MOZART: Complete 5 Piano Trios;** A. Jambor, piano; V. Aitay, violin; J. Starker, cello
★ **SCHUMANN: Piano Quintet in E Flat, Op. 44;** H. Kann, piano, with Pascal String Quartet • **Quartet in A, Op. 41, No. 3;** Winterthur String Quartet
★ **BACH: Four Sonatas for Violin, Cello and Harpsichord;** P. Rybar and M. Rostal, violins; A. Tusa, cello; T. Sack, Harpsichord
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BIOLOGY

NATURE RAMBLINGS

by Horace Loftin

Animal Old-Timers

➤ HOW OLD is an "old" animal? This question intrigues both scientists and nature lovers. We know the age limits of many common species. The elephant and the parrot, for instance, both may live a century. Cats that have lived up to 30 active years are on record.

The "seventeen-year locust," an insect, spends 17 years under the earth as a grub, then emerges as a winged cicada for one brief summer. A giant anaconda, which grew to be 17 feet long, holds the old age record for snakes in captivity in the United States. This snake lived to be 28 years old in its Washington, D. C., zoo home.

Recently a new old age figure for the Gila monster, the only poisonous lizard in the United States, has been reported. Biologist Arthur M. Crosman of New York University has called attention to a pair of Gila monsters that have been kept in captivity since September, 1930, or for more than 25 years.

These brilliantly colored pink and black lizards were a little less than half their present size, 19 inches long, when they were captured—about nine inches long 25 years ago. Since Gila monsters are usually about four inches long when they hatch from their eggs, this ancient pair of lizards evidently were already several months old when captured.

The Gila monster, *Heloderma suspecta*, is an inhabitant of the U. S. southwestern deserts. It and the Mexican beaded lizard, *Heloderma horridum*, a close relative from south of the border, are the only lizards in the world definitely known to be poisonous. A more distant relative of the two from Borneo, *Lanthanotus*, is under suspicion of being poisonous but has not been proved guilty.

The pair of ancient Gila monsters live a placid life in their laboratory cage and are quite sluggish. Captive Gila monsters do not object to being handled and seem to enjoy having their beady backs stroked. Wild Gila monsters are quite different, showing bad tempers and an agility amazing for their large size.

Although experts and amateurs argue about just how poisonous the Gila monster is, one set of statistics gathered showed that 20% of humans bitten by them died as a result. Whether this figure is high or low, it certainly indicates that the Gila monster should be treated with caution.

Besides biting, Gila monsters have been known to work up poison and saliva into a froth and blow it in generous sprays at animals that annoy them.

Science News Letter, April 21, 1956

BIOCHEMISTRY

Antibiotic Detoxifies After Liver Operation

➤ NEOMYCIN is effective in reducing the accumulation of noxious ammonia in the blood following an operation to relieve a condition arising in cirrhosis of the liver.

In cirrhosis, liver damage slows down the flow of blood through that organ, causing back-pressure in blood vessels. Pressure is greatest in veins of the esophagus, and death from hemorrhage following rupture of those vessels is a danger.

To relieve the pressure, as much as 70% of the blood that normally flows through the liver is shunted into the general blood stream by an operation. But this blood does not undergo the liver's detoxification process, and ammonia accumulates in the blood and poisons the system.

Clinically, physicians have obtained good results generally by using a diet low in protein, which is a source of ammonia, and administering antibiotics to reduce the colon's population of bacteria that break down proteins.

However, the factors involved were so complex that it has been difficult to determine what measures give good results. And reductions in ammonia had not actually been demonstrated with antibiotics.

Using animals, the California researchers demonstrated that neomycin sterilizes the intestine and reduces ammonia. Other antibiotics did not reduce ammonia. The results with neomycin have been confirmed in human patients, especially in the critical phase right after operation.

The scientists are Drs. William Silen, Harold A. Harper, Dean L. Mawdsley and William Weirich.

Science News Letter, April 21, 1956

VETERINARY MEDICINE

Sleeping Sickness Kills Southeast Horses, Mules

➤ HORSES AND MULES in southeastern United States are being killed by sleeping sickness in greater numbers than at any time in recent years.

U. S. Department of Agriculture officials believe the higher mortality rate is caused by the more deadly Eastern virus. The Western virus, while milder, is usually more widespread. Vaccination against the one type does not protect an animal against the other.

Outside the South, Massachusetts and Rhode Island reported the disease in 1955. No cases were reported in either state in 1954. Wyoming, Colorado and New Mexico also report increases.

The virus, which can cause encephalitis in human beings, is carried chiefly by mosquitoes. The virus has visited nearly every state in the nation. The best way to prevent outbreaks of the disease among horses is by vaccination.

Science News Letter, April 21, 1956

Questions

CHEMISTRY—To what use are fats not used for soap being put? p. 251.

☐ ☐ ☐

GENERAL SCIENCE—What is meant by "disarming the future? p. 243.

☐ ☐ ☐

MEDICINE—What kind of pills are now being tried on human diabetics? p. 244.

☐ ☐ ☐

PSYCHOLOGY—How does on-the-job integration affect race prejudice? p. 245.

☐ ☐ ☐

VETERINARY MEDICINE—How can a horse's peak condition for racing be determined? p. 252.

☐ ☐ ☐

PHOTOGRAPHS: Cover, Argonne National Laboratory; p. 243, Ann Ewing; p. 245, Minneapolis-Honeywell Regulator Company; p. 247, U. S. Navy; p. 256, CMG Industries, Inc.

· New Machines and Gadgets ·

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 827. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

⚙ *FOLDING TABLE LEGS can be used to replace wobbly "fixed" table legs or for assembling new tables. Made of one-inch heavy gauge steel tubing, the legs are equipped with safety locks to prevent accidental folding. Any table top can be used and only a screw driver is needed for installation.*

Science News Letter, April 21, 1956

⚙ *TUBELESS-TIRE REPAIR KIT contains rubber plugs for insertion through the puncture hole and cement for bonding by chemical vulcanization. The kit eliminates the need for removing the tire from the wheel, and with it 20 repairs can be made.*

Science News Letter, April 21, 1956

⚙ *HAT CARRIER to keep a man's hat clean and in shape while driving is attached to the car ceiling above the front seat. The metal hat rack for autos can be installed and removed easily, and is adjustable to any size hat.*

Science News Letter, April 21, 1956

⚙ *FISHING LEADER is adaptable to any type of fishing. It features a coil-like spring that stretches and keeps the bait constantly animated. The leader coil eliminates bobber resistance.*

Science News Letter, April 21, 1956

⚙ *CHAIR LIFTS convert any chrome or aluminum tubular chair into a youth's chair, as shown in the photograph, eliminating the need for putting junior on telephone books. Made of hardwood, the lifts are inserted in the tubes with a hammer and can be adjusted to proper height for ages two to eight.*

Science News Letter, April 21, 1956

⚙ *EMERGENCY ROAD LIGHT for automobiles operates off the cigarette lighter. It throws a revolving red beam that can be seen for more than 300 yards and has a suction cup base for mounting on the car or pavement. The light also comes with a clear lens for use as a flashlight.*

Science News Letter, April 21, 1956

⚙ *AUXILIARY SHELVES are designed for the housewife to utilize the "in between" space in her refrigerator. The wire arms of the space-saving shelves or racks can be spread for height selection.*

Science News Letter, April 21, 1956

⚙ *SILICONE COMPOUND lubricates and protects rubber weather-stripping on hoods, trunk lids, doors and windows of cars. It helps keep battery terminals clean and protects ignition systems. Effective at temperatures from 40 degrees below zero to 400 degrees Fahrenheit, the compound is non-melting, nonfreezing and nongumming.*

Science News Letter, April 21, 1956

Do You Know?

Chemical *seed treatments* have increased field stands of peas by as much as 50% over untreated seed.

The Government hopes to plant 6,000,000 catchable-size *trout* in waters on Federal lands and in waters near Federal installations during 1956.

Research results show that caloric intake and B-vitamin complex and protein intake must be relatively much higher in the *cat* than in the dog.

An albacore *tuna* tagged 1,300 miles north of Hawaii was recaptured near Japan, 2,370 miles away, 471 days later.

A technique of controlled-atmosphere storage has extended the edible life even of delicate *apples*.

Two important *minerals*, columbium and tantalum, which have been scarce in the United States since before the Korean conflict, now are plentiful enough to meet all known civilian uses.